

Determining the causes of postural hypotension

Frank Molnar MSc MD CM FRCPC Christopher C. Frank MD CCFP(COE) FCFP

Clinical question

What is an effective approach to detecting and addressing the myriad causes of postural hypotension?

Bottom line

Humans need to maintain continuous intracranial perfusion despite the persistent effect of gravity. In a recent *Canadian Family Physician* blog (cfp.ca/blog), postural hypotension was described as “the missing vital sign.”¹ Postural hypotension is easy to miss and, even when detected, it is challenging to work through the complex differential diagnosis. Often the cause is multifactorial, requiring a systematic approach to assessing and prioritizing contributing factors. The 4D-AID approach (originally 3D-AID²) provides a useful framework (**Box 1**).³ This article provides a practical summary of comprehensive reviews of postural hypotension published by the Canadian Geriatrics Society, including a detailed description of the 4D-AID³ and approaches to treatment and management.⁴

Evidence

- Standing from a supine position causes approximately 10% to 15% of our blood to pool in the venous beds of the lower extremities and splanchnic system.⁵
- Postural hypotension causes considerable morbidity in community-dwelling and institutionalized older persons.⁶
- All older patients presenting with presyncope, syncope, or falls should be evaluated for postural hypotension.⁷
- In patients without marked symptoms of autonomic failure, sustained reduction in standing blood pressure (BP) at 1 minute correlates with negative outcomes, including car crashes.⁸

Approach

- Consensus cutoffs defining postural hypotension are sustained reduction in systolic BP of at least 20 mm Hg or diastolic BP of 10 mm Hg within 3 minutes of standing.⁹
- A manual or electronic cuff is typically used to record supine BP (after lying ≥ 5 minutes to allow equilibration of blood volume) and after 1 and 3 minutes standing.¹⁰
- Failure of heart rate to increase in the setting of BP drop might be a clue to underlying autonomic pathology (or β -blocker use), while exaggerated heart rate increase is more suggestive of intravascular volume depletion.¹⁰
- In the absence of autonomic dysfunction (which can cause delayed BP drop) the 1-minute measure might yield helpful information about the risk of negative outcomes.⁸

Box 1. Differential diagnosis: 4D-AID acronym.³

Causes associated with compensatory tachycardia: 4Ds

- **D**econditioning
- **D**ysfunctional heart: myocardium (low left ventricular ejection fraction), aortic stenosis
- **D**ehydration: disease (eg, acute illness, adrenal insufficiency), dialysis (postdialysis dry weight too low), drugs (diuretics, anorectic drugs [narcotics, digoxin, antibiotics, cholinesterase inhibitors])
- **D**rugs—6 *anti*'s: antihypertensives, antianginals, anti-parkinsonian medications (eg, levodopa), antidepressants (eg, anticholinergic tricyclics), antipsychotics (anticholinergic effect), anti-benign prostatic hyperplasia medications (eg, terazosin, tamsulosin)

Causes that present without compensatory tachycardia: AID

- **A**utonomic dysfunction: diabetic autonomic neuropathy (consider if patient has peripheral neuropathy), low vitamin B12, hypothyroidism, ethanol abuse, parkinsonism (Parkinson disease, progressive supranuclear palsy, multisystem atrophy), amyloidosis
- **I**diopathic (pure autonomic failure): depletion of norepinephrine from sympathetic nerve terminals
- **D**rugs: β -blockers

Implementation

Routinely check BP supine then standing with older patients. If this is not feasible, targeting frail older patients is recommended, especially those with balance issues, near falls, or falls. Postural BP should be measured for hospital inpatients, preferably not using automatic cuffs. Access resources for diagnosis and treatment of postural hypotension, including practical patient handouts and position papers reviewing evidence, at www.posturalhypotension.ca.

Dr Molnar is a specialist in geriatric medicine practising in Ottawa, Ont. **Dr Frank** is a family physician with a Certificate of Added Competence in Care of the Elderly practising in Kingston, Ont.

Competing interests

None declared

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